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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/645,690

08/24/2000

Lizhong Sun

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08/27/2002

APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER

WINTER, GENTLE E

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 08/27/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/645,690

Applicant(s)

SUN ET AL.

Examiner

Gentle E. Winter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 19-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 19-25 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of the invention of Group I, consisting of claims 1-18 in Paper No. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Information Disclosure Statement

2. Applicant's counsel, Michael A. Messina, thanked for his prompt delivery of a replacement copy of the IDS, which was properly submitted on or about January 17, 2001, but was not found in the file.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

i. Claim 5 recites the limitation "deionized water" in line 4. There is insufficient antecedent basis for this limitation in the claim. Applicant may assert that DI water is intended in claim 1.

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ii. Calm 10 recites “removing any substrates from the wafer surface before applying the cleaning composition to the polishing pad surface.” It is not altogether clear what is intended by “substrates”. Seemingly the wafer itself could be a substrate. It is not clear exactly what is contemplated by “substrates”. It is assumed that this refers to surface coatings other than the wafer itself.

Claim Objections

2. Claims 4, 5, and 15 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

b. With respect to claims 4 and 15 the pH range indicated is seemingly disclosed in the respective dependant claims. Specifically, claim 4 is rejected for the reasons set forth in claim 1, and claim 15 is rejected for the reasons set forth with respect to claim 12.

c. With respect to claim 5, it is not clear what additional method steps are contemplated. The method appears to be drawn to describing a property

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 1-4, 8, and 12-16 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,981,454 to Small.

4. Small discloses a method of cleaning a polishing pad comprising applying to the polishing pad surface a cleaning composition comprising applying to the polishing pad surface a cleaning composition comprising a composition that has an amine concentration that includes at least one endpoint of the claimed range, specifically 3.0 Wt% of at least one organic compound containing one or more amine or amide groups. The explicitly disclosed range is 3-20% (column 3, line 52 *et seq.*) however figure 3 appears to contemplate a range of activity below 3% (see e.g. column 4, line 6 *et seq.* and also see figure 3). Small further discloses an acid or base such that the composition has a pH of between 3.5 and 7, which anticipates the range 5.0 to about 12.0, and water. See (column 2, line 37 *et seq.* and column 3, line 52 *et seq.*). Small further discloses using DI water, ethylene diamine, and acetic acid (column 14, line 43 through column 16). A water rinse is also disclosed (column 1, line 38 *et seq.*).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5-7, 9-11, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Small in view of United States Patent No. 6,280,299 to Kennedy et al.

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6. Each and every limitation of claims 6, 7, 9, 10, 11, 17, and 18 are identically disclosed in Small, except that Small apparently fails to explicitly disclose applying the solution to a rotating polishing pad at a flow rate of about 10 to 600 ml/min. Kennedy et al. discloses using a flowrate between 230 and 6000 ml/min (e.g. column 6, line 58 *et seq.*). The artisan would have been motivated to make the instant combination for the reasons explicitly set forth in Kennedy et al. Kennedy discloses that the pad cleaning flowrates and pressures are optimized based on the conditions and materials used in the pad cleaning process. In a larger sense, the artisan would have been motivated to select a flow rate high enough to reduce the pad loading to an acceptable level, while minimizing solvent waste. Similarly, it is submitted that duration of the flow would be a matter of routine optimization, but is explicitly disclosed in Kennedy et al. as about 5 to 20 seconds (see e.g. column 7, line 47 *et seq.*). Again the motivation is explicitly disclosed in Kennedy et al. specifically, optimizing the cleaning of the pad. Further, Kennedy et al. and the instant invention appear to be performing substantially the same task, in substantially the same way, for substantially the same reason.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(1) United States Patent No. 5,738,574 to Tolles et al. disclose polishing pads mounted on platens and a pad conditioner to recondition the polishing pad so that it retains a high polishing rate. A washing station is disposed to clean the polishing pads when the polishing is

complete. A multiple of polishing pads can be used to sequentially polish a wafer. The polishing steps may be equivalent, may provide polishes of different finish, or may be directed to polishing different levels.

(2) United States Patent No. 6,033,993 to Love, Jr. et al. discloses a similar system but requires a meaningfully lower pH.

(3) United States Patent No. 6,220,941 to Fishkin et al. disclosing a method of cleaning a polishing pad surface, by delivering a spray of one or more rinse agents to the surface and, preferably, causing the rinse agent to flow across the surface of the pad. Flowrates and compositions are also discussed.

(4) United States Patent No. 6,352,595 to Svirchevski et al. discloses a method and a system for cleaning a CMP pad. Including the steps of applying chemicals onto the surface of the CMP pad. The chemicals are then allowed to react with a residue that may be on the pad to produce by-products. Next, the pad surface is rinsed to substantially remove the by-products. A mechanical conditioning operation is then performed on the surface of the pad. In one example, the wafer surface can be a metal, such as copper. This reference is believed to procedurally include all of the limitations of the present invention. Apparently lacking in the disclosure

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is at least on organic compound containing one or more amide or amine groups.

(5) WO 99/46353 substantially discloses the identical chemical cleaning composition, including pH, and discusses the problems with Cu contaminate brush loading and cleaning procedures.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter
Examiner
Art Unit 1746

August 22, 2002



RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700